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(54) **COMMON JIG APPARATUS FOR MOUNTING FENDER OF MULTIFARIOUS VEHICLE**

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B62D 65/02 (2006.01)

(52) **U.S. Cl.**
CPC ***B62D 65/026*** (2013.01)
USPC **29/281.1**; 29/278

(58) **Field of Classification Search**
USPC ..... 29/281.1, 278, 270; 254/2 B, 10 B, 10 C
See application file for complete search history.

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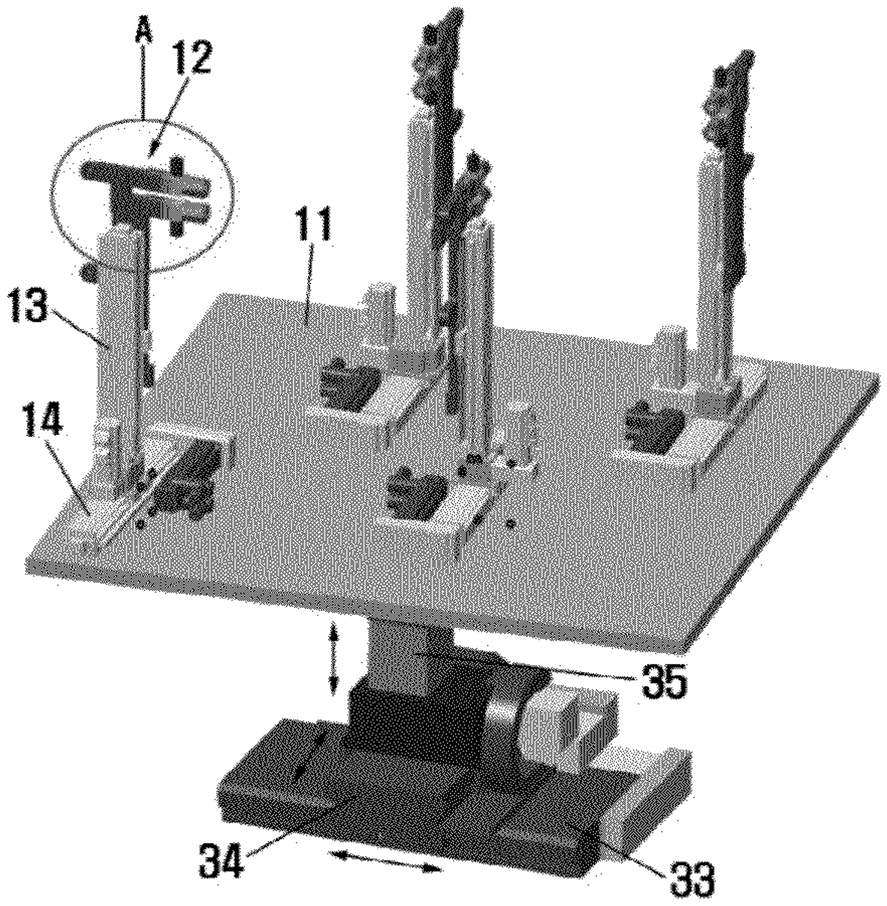
(57) **ABSTRACT**

The present invention provides a common fender mounting jig apparatus for use with multifarious vehicles including a plurality of common clamping units for clamping fender panels of multifarious vehicles by using, selectively, a plurality of fixing blocks processed in compliance with the shape of a fender panel associated with each vehicle model. Additionally, the common fender mounting jig may also include a clamp movement unit for moving the common clamping unit upwardly and downwardly, forwardly and backwardly; a fender mounting jig mounted on its upper face with the common clamping unit and loading the fender panel clamped by the common clamping unit on a body-in-white; and a jig movement unit for moving and rotating the fender mounting jig. By using only one common clamping unit, the present invention is able to comply with various shapes of fender panels of multifarious vehicles.

18 Claims, 10 Drawing Sheets



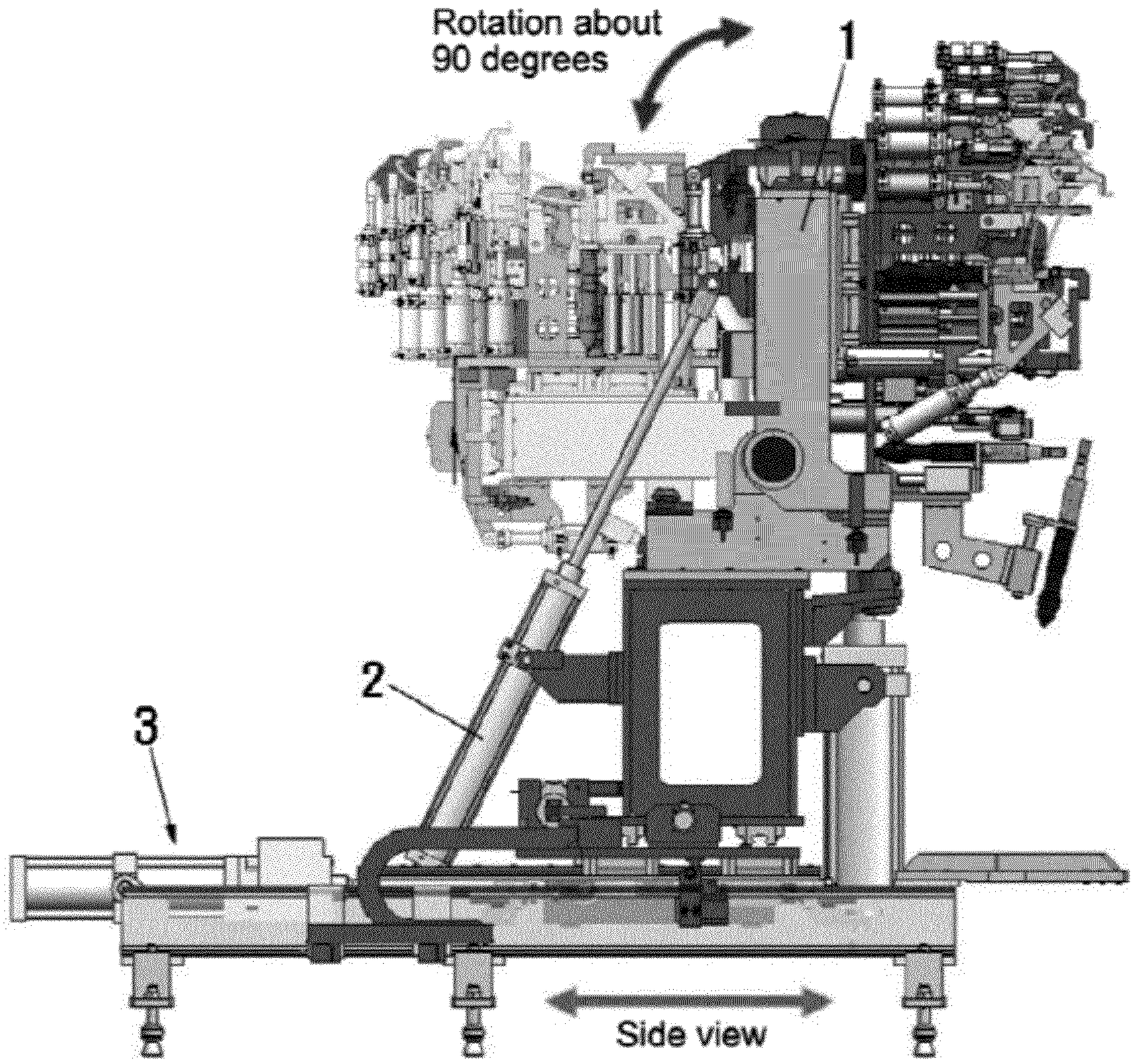


FIG. 1

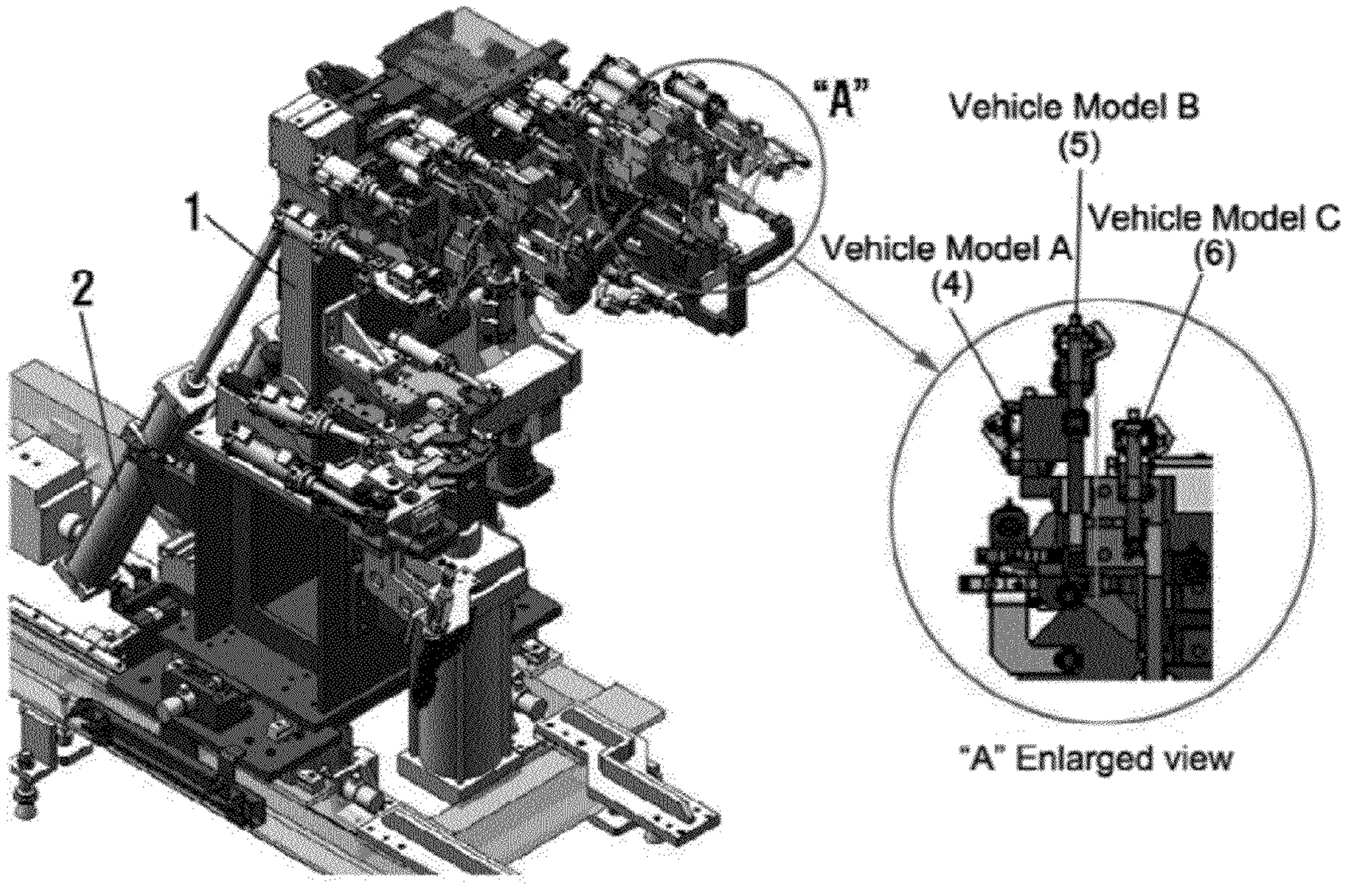

1
2
"A"
Vehicle Model B
(5)
Vehicle Model A
(4)
Vehicle Model C
(6)
"A" Enlarged view

FIG. 2

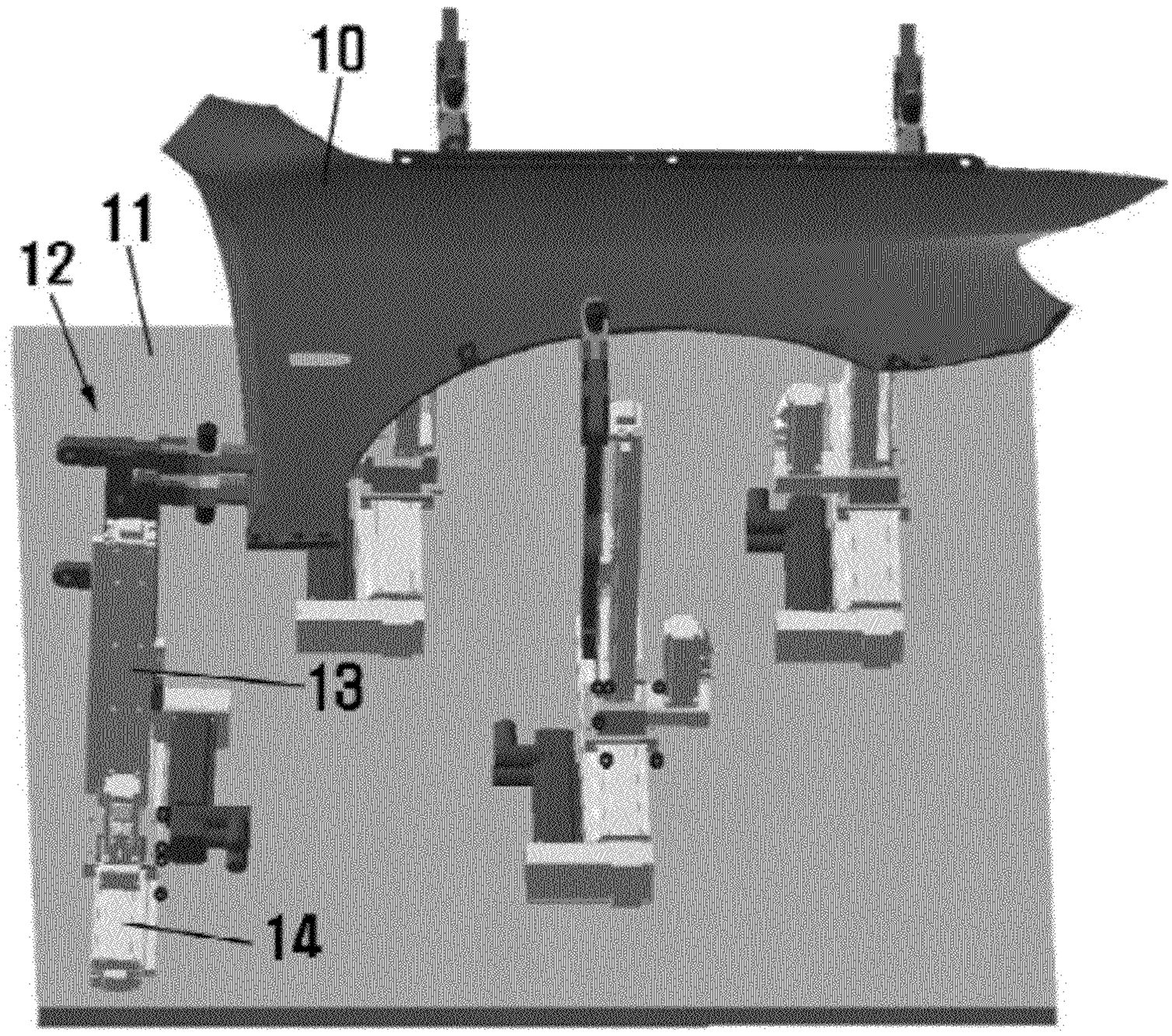


FIG. 3

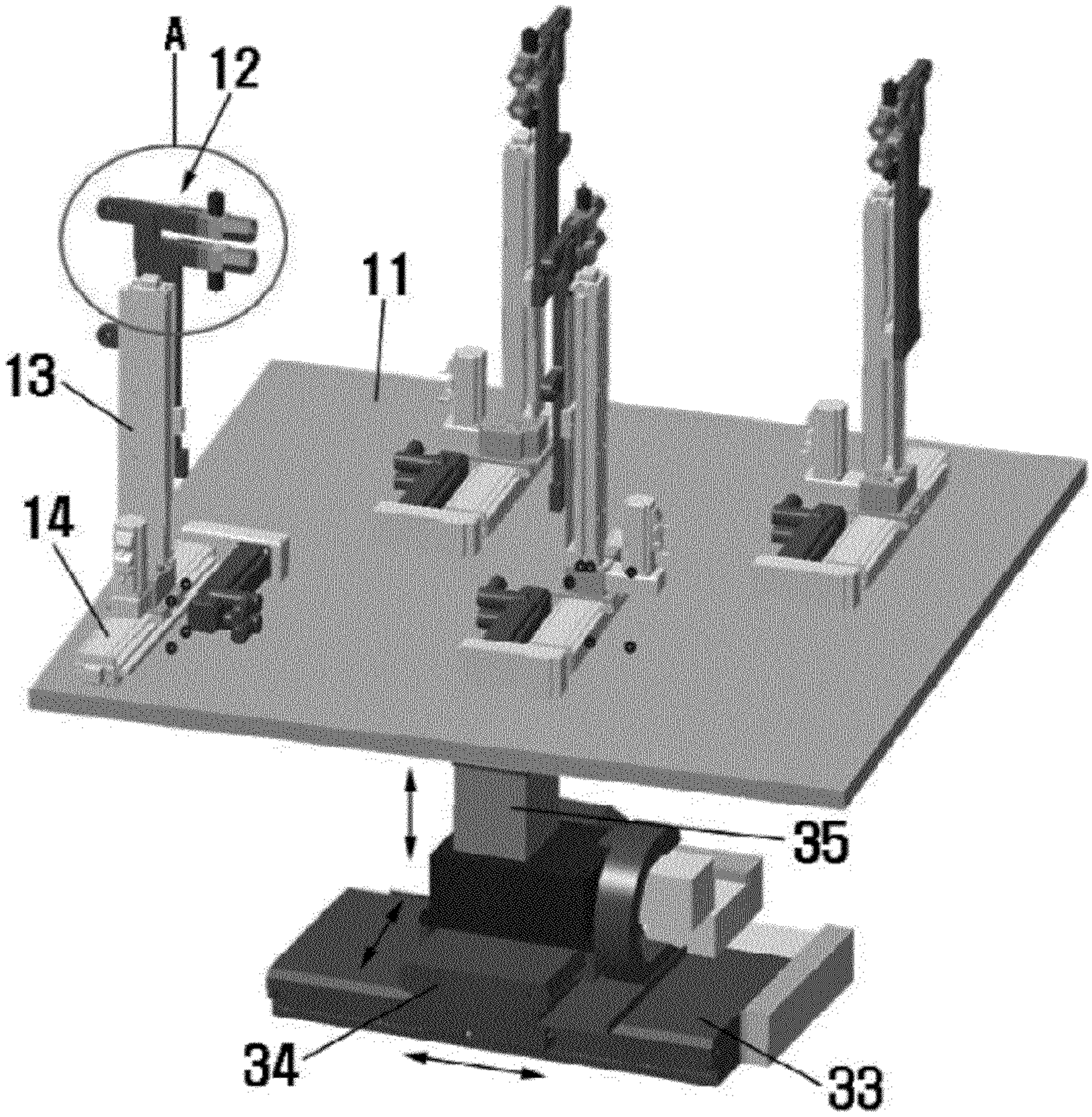


FIG. 4

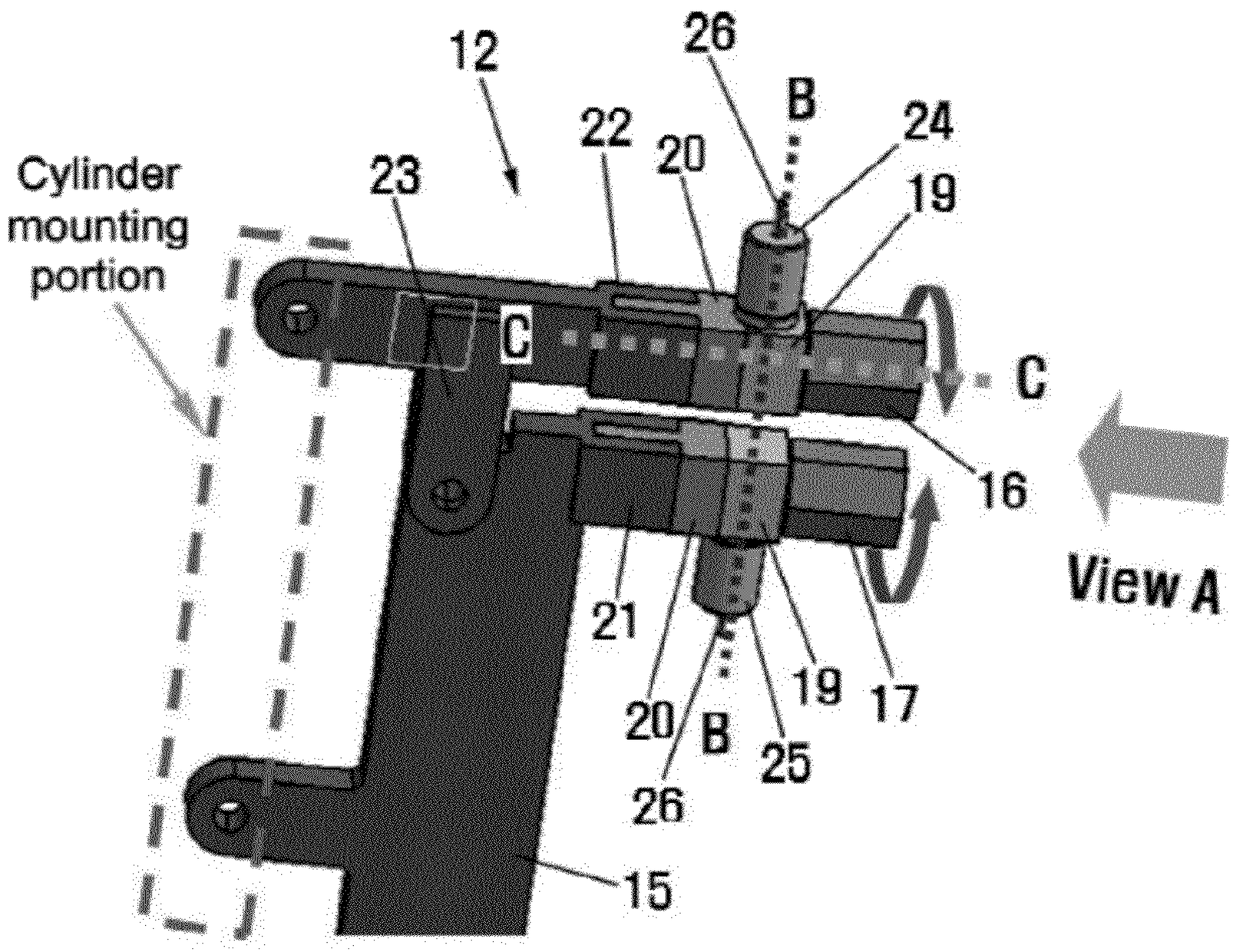

12
26
B
24
22
20
19
23
Cylinder mounting portion
C
C
16
View A
21
20
B
19
17
25
26
15

FIG. 5

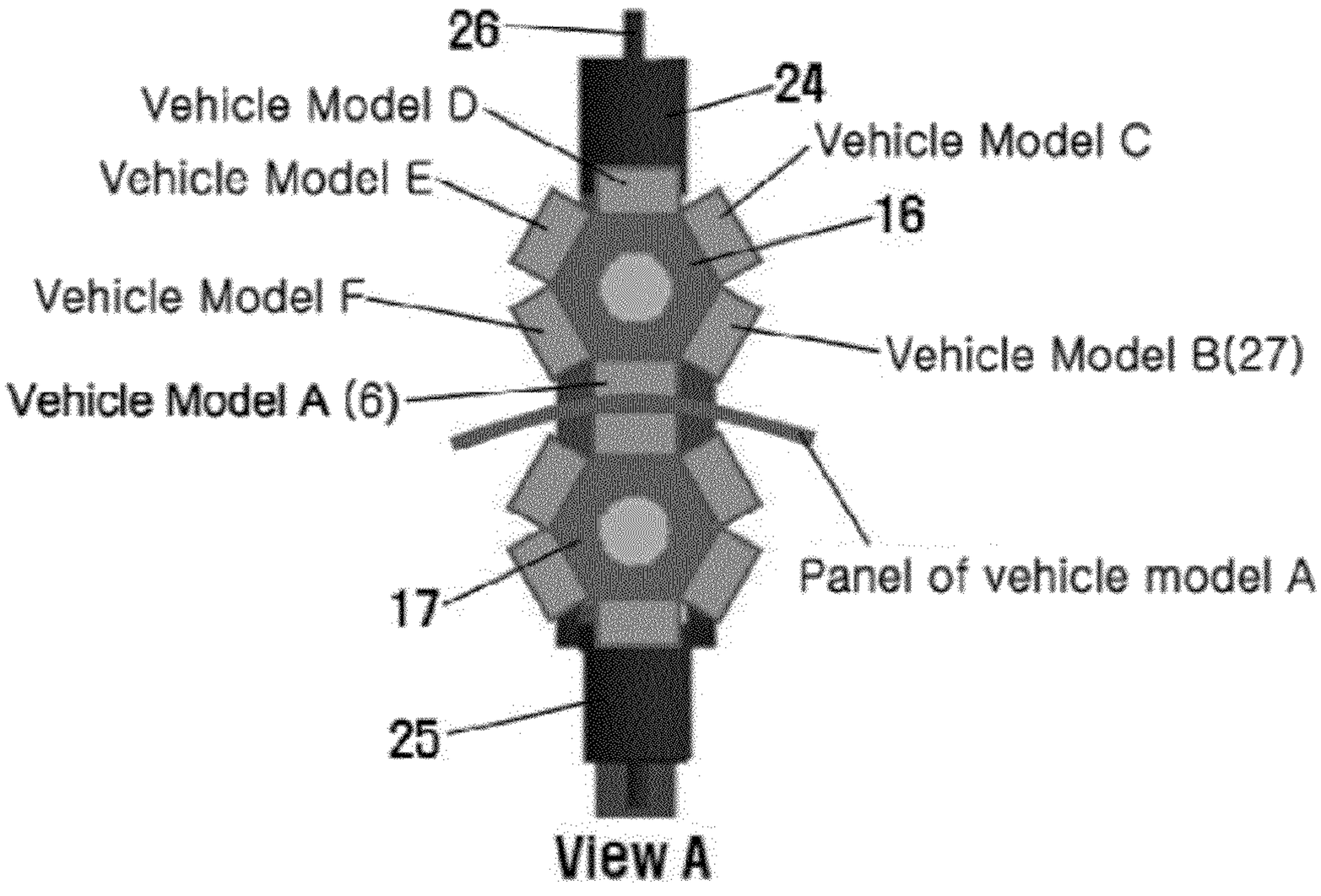
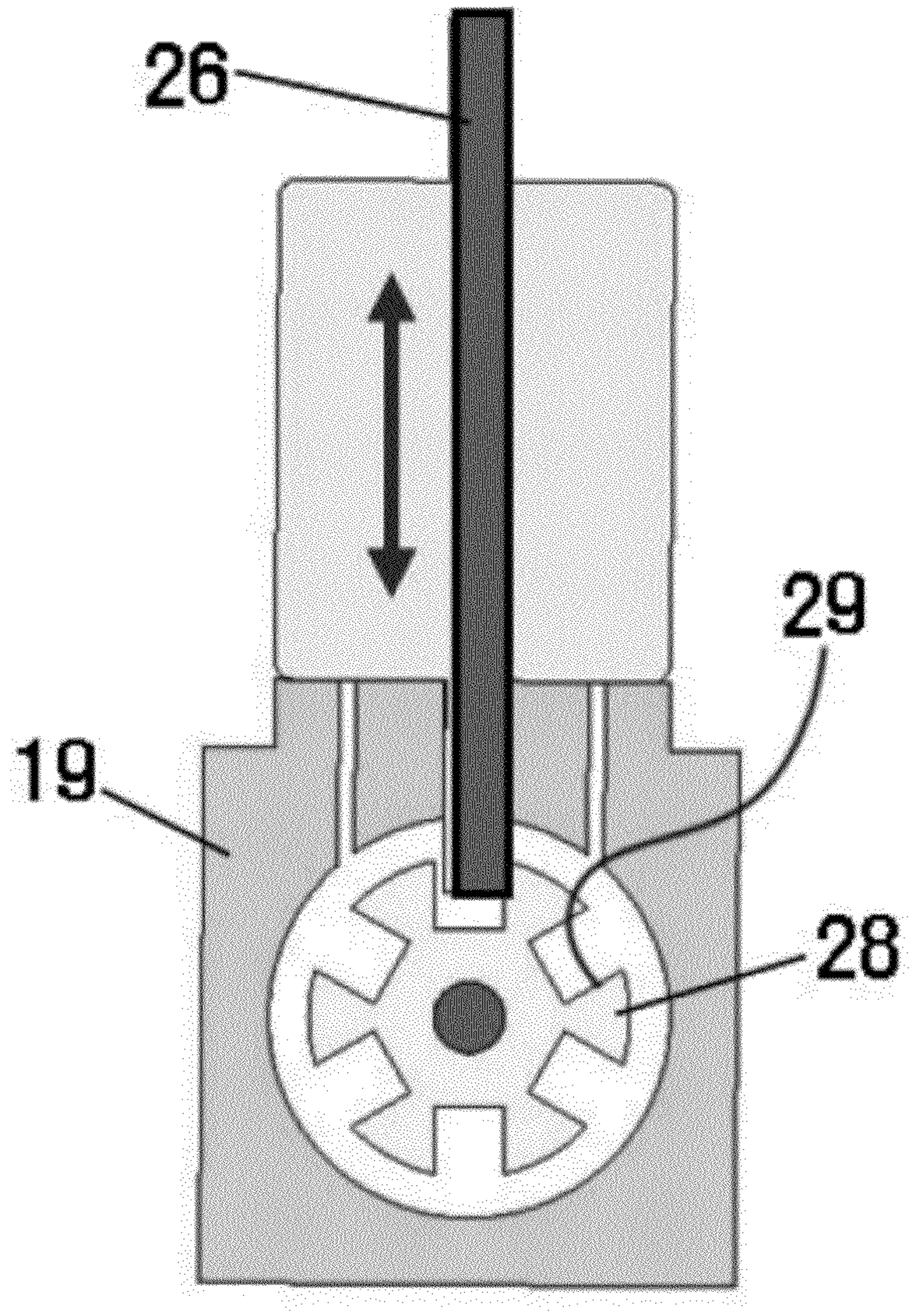
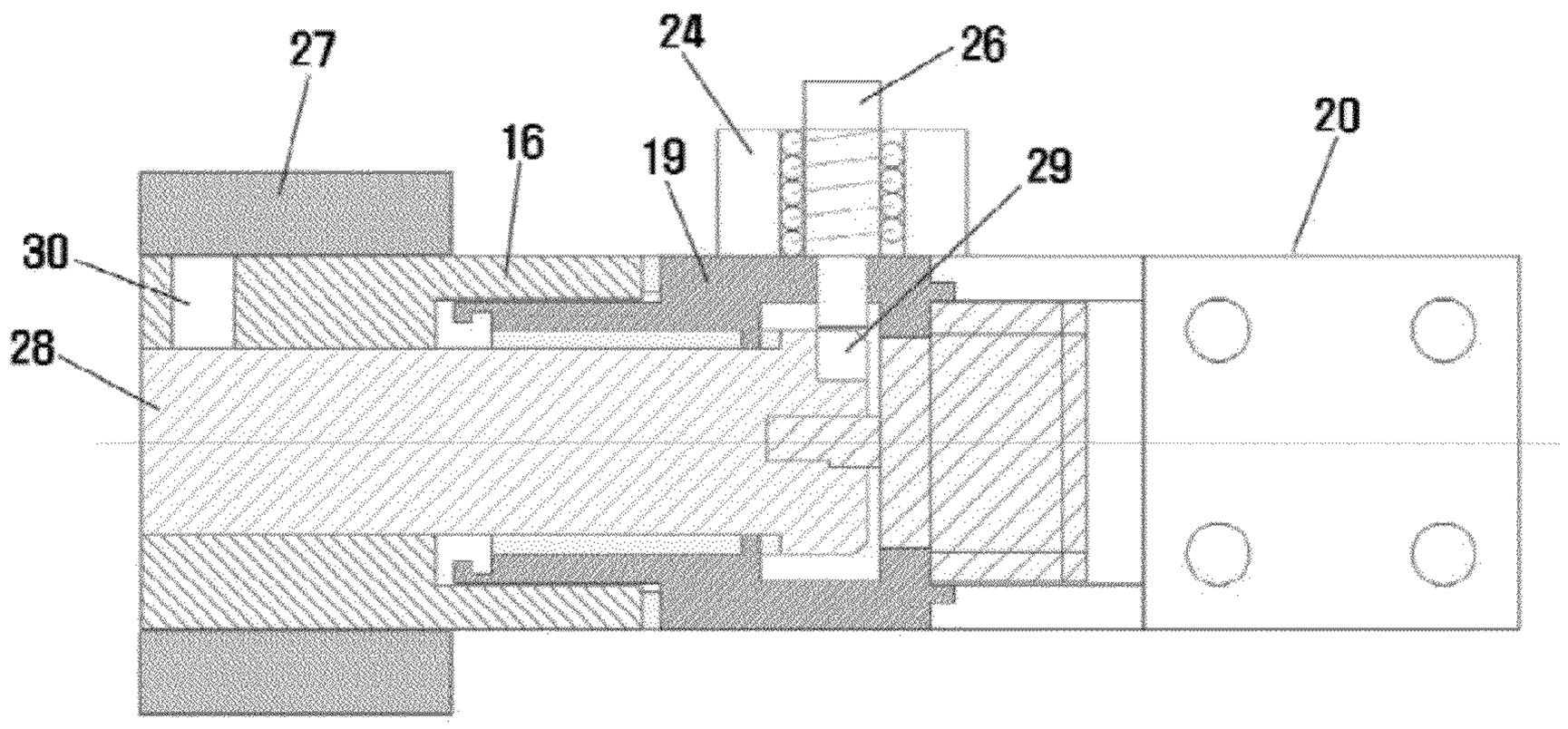

26
24
Vehicle Model D
Vehicle Model C
Vehicle Model E
16
Vehicle Model F
Vehicle Model B(27)
Vehicle Model A (6)
Panel of vehicle model A
17
25
View A

FIG. 6



Cross sectional view along B-B

FIG. 7



Cross sectional view along C-C

FIG. 8

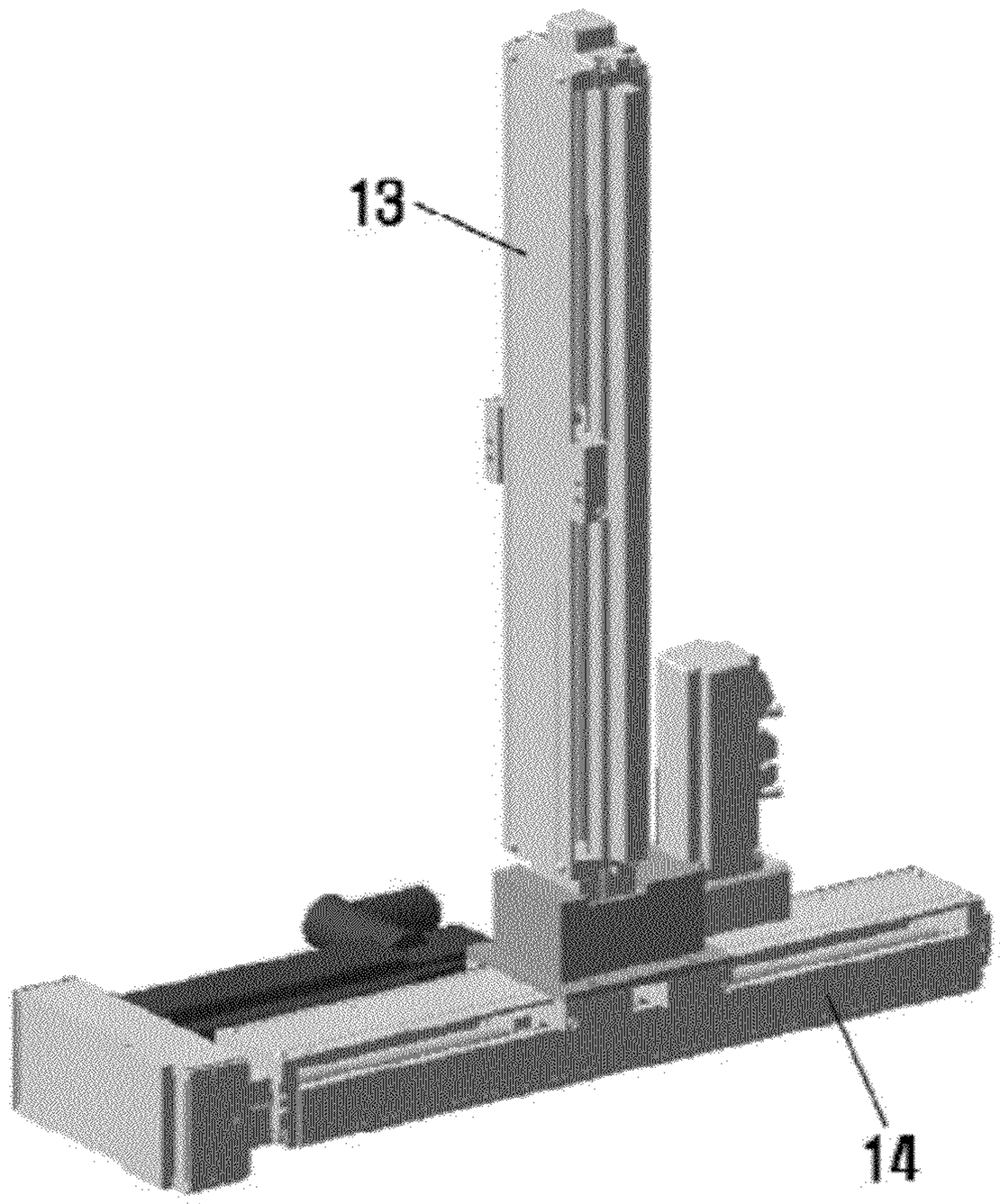


FIG. 9

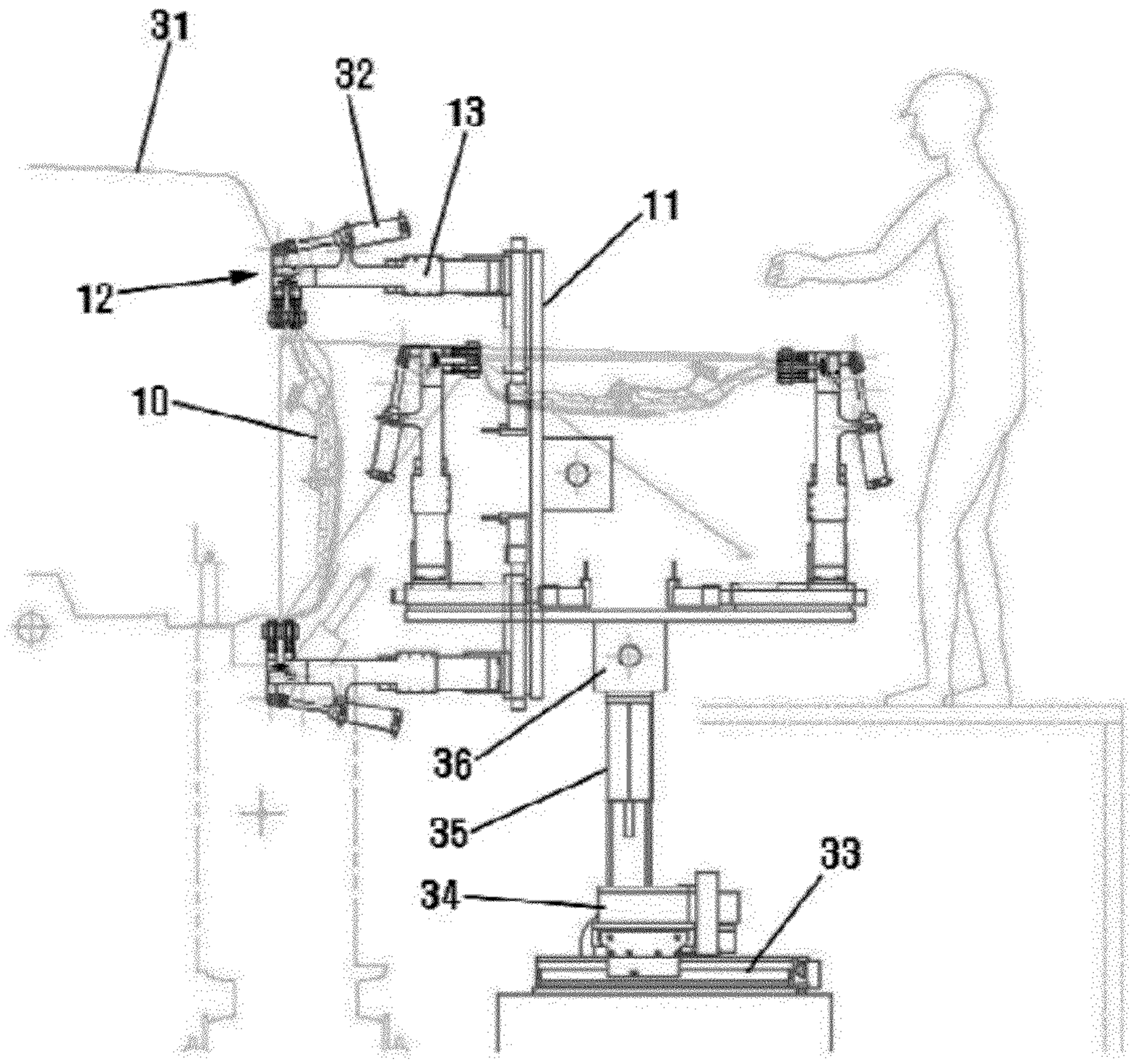


FIG. 10

COMMON JIG APPARATUS FOR MOUNTING FENDER OF MULTIFARIOUS VEHICLE

CROSS-REFERENCE TO RELATED APPLICATION

This application claims, under 35 U.S.C. §119(a), the benefit of Korean Patent Application No. 10-2010-0121089 filed Dec. 1, 2010, the entire contents of which are incorporated herein by reference.

BACKGROUND

(a) Technical Field

The present invention relates to a common jig apparatus for mounting fenders of multifarious vehicles. More particularly, it relates to a common fender mounting jig apparatus for multifarious vehicles that is capable of responding to various fender panel shapes of multifarious vehicles.

(b) Background Art

Body in white or BIW refers to the stage in automotive design or automobile manufacturing process in which a car body's sheet metal components have been welded together but the removable parts (e.g., doors, hoods, and deck lids as well as fenders the motor, chassis sub-assemblies, or trim (glass, seats, upholstery, electronics, etc.) have not been added and the vehicle has not been painted.

During this process, panels of a body-in-white for forming a vehicle body are manufactured in a press process, and conveyed to the body-in-white assembling factory to be assembled onto a vehicle body. The assembled body-in-white is mounted with appearance panels which include the door trunk lid, the hood, fender or the like, and then conveyed to a painting process to be painted.

Next, the vehicle is processed in a trim line, where various kinds of auto parts including the engine, the transmission, and the interior and exterior materials are assembled to form one complete vehicle.

Generally, a worker mounts fenders on a vehicle using a fender mounting jig apparatus in a body-in-white assembling factory. The fender mounting jig apparatus, as shown in FIGS. **1** and **2**, includes a fender mounting jig **1** which is mounted along with a plurality of clamp units to support and fix the fender. A cylinder **2** for jig rotation is configured to rotate the fender mounting jig **1**, and a horizontal movement means **3** is configured for moving the fender mounting jig **1** in a horizontal direction and in a vertical direction.

A method for mounting a fender using the fender mounting jig apparatus typically includes loading a fender, fixing the fender, rotating the fender mounting jig **1** in a 90-degree arc by means of the jig rotating cylinder **2**, making the fender approach a body-in-white (BIW), and allowing the worker to assemble the fender onto the body-in-white by means of an engagement means such as bolts.

In general, the fenders of prior model year vehicles differ in their size and shape from those of a new or current model year vehicles. Therefore, it is necessary to newly manufacture the fenders or modify a large number of clamp units to support or fix the fenders of the new vehicle to the existing fender mounting jig **1**.

In order to respond to the sizes and shapes according to the models of vehicles, the conventional fender mounting jig **1**, as shown in FIG. **2**. The conventional fender mounting jig **1** has corresponding exclusive clamp units **4**, **5**, **6** according to each of the models of vehicles (e.g., model A, model B and model C of vehicles). Thus, the conventional fender mounting jig **1** can comply with variations in sizes and shapes of panels of

new vehicles when new fenders of new vehicles are to be applied to the fender mounting jig **1**.

However, one noted disadvantage of the conventional jig discussed above is that the conventional exclusive clamp units **4**, **5**, **6** cannot comply with different sizes and shapes of fenders when there are more than 4 models of vehicles using different sized or shaped fenders. In other words, although the fenders of 4 different vehicle models may be clamped with the exclusive clamp units **4**, **5**, **6**, more than 4 different fenders cannot be accounted for. Accordingly, whenever a new fender of a new model of vehicle is assembled, a corresponding new exclusive clamp unit must be installed. As would be understood by those skilled in the art, it is difficult to install new clamp units due to the lack of space for installing surrounding the exclusive clamp unit in the jig.

Thus, the existing clamp unit must be replaced with a new clamp unit whenever there is a change in vehicle model. This results in increase in investment cost for new equipments and requires additional time for installing new equipments and parts and any exchanges needed thereof thereby also increasing manufacturing costs.

The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

SUMMARY OF THE DISCLOSURE

The present invention provides a common fender mounting jig apparatus for multifarious vehicle models, which installs a fixing block for each model of vehicles on each side of polygonal clamping block. The clamping block is then rotated by a driving motor and a fender panel is clamped with the fixing block fixed by an actuator, so that one common clamping unit may be used regardless of how many new fender panels of various models of vehicles are applied. Thus, the problem associated with the lack of space for installing clamping unit is resolved.

In one aspect, the present invention provides a common fender mounting jig apparatus for multifarious vehicle that includes a plurality of common clamping units for clamping fender panels of multifarious vehicles. More specifically, the common fender mounting jig uses a selectively a large number of fixing blocks processed in compliance with a shape of fender panel according to each model of vehicles. The common fender mounting jig unit also includes a clamp movement unit for moving the common clamping unit upwardly and downwardly, forwardly and backwardly. Also, a fender mounting jig may be mounted on the common fender mounting jig's upper face along with the common clamping unit and loading the fender panel clamped by the common clamping unit on a body-in-white. A jig movement unit may be provided for moving and rotating the fender mounting jig.

In a preferred embodiment, the common clamping unit may include a first clamping block and second clamping block have a polygonal shape. These first and second clamping blocks may be mounted on each face of the polygonal shape thereof along with a fixing block for each model of vehicles. The fender panel may then be clamped by turning the fender on an axis of rotation. A driving motor may also be connected to the first and second clamping blocks through the axis of rotation in order to rotate the first and second clamping blocks accordingly.

In another preferred embodiment, the common fender mounting jig apparatus may further include an actuator for pushing an operation rod into a fixing groove formed in a

circumferential direction on the axis of rotation of the fixing block to fix the fixing block, and for clamping the fender panel of multifarious vehicles with the fixing block.

Advantageously, the fixing block has the same shape as the fender panel of each model of vehicles is mounted on each face of the clamping block of polygonal shape. Specifically, the clamping block may be fixed in its position by a position stopper after the clamping block is rotated, and the fixing block may be mounted on each face of the clamping block. Thus, one common clamping unit according to the present invention may be used with various fender panel shapes sizes of multifarious vehicles. That is, the present invention does not require any modification to the existing clamping unit or manufacturing of a new clamping unit when a new model of vehicle is introduced to the vehicle line.

It is understood that the term "vehicle" or other similar term as used herein is inclusive of motor vehicles in general such as passenger automobiles including sports utility vehicles (SUV), buses, trucks, various commercial vehicles, watercraft including a variety of boats and ships, aircraft, and the like, and includes hybrid vehicles, electric vehicles, plug-in hybrid electric vehicles, hydrogen-powered vehicles and other alternative fuel vehicles (e.g., fuels derived from resources other than petroleum). As referred to herein, a hybrid vehicle is a vehicle that has two or more power sources, e.g., both gasoline-powered and electric-powered vehicles.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features of the present invention will now be described in detail with reference to certain exemplary embodiments thereof illustrated the accompanying drawings which are given hereinbelow by way of illustration only, and thus are not limitative of the present invention, and wherein:

FIG. **1** is an exemplary side view showing a fender mounting jig apparatus according to a conventional art;

FIG. **2** is an exemplary perspective view of FIG. **1**;

FIG. **3** is an exemplary perspective view illustrating a fender panel mounted on a common fender mounting jig apparatus according to a preferred embodiment of the present invention;

FIG. **4** is an exemplary perspective view showing the common fender mounting jig apparatus as shown in FIG. **3**;

FIG. **5** is an enlarged view showing portion A shown in exemplary FIG. **4**;

FIG. **6** is a front view of exemplary FIG. **5** viewed in an A direction indicated by an arrow;

FIG. **7** is a cross sectional view taken along the dotted line B-B as shown in exemplary FIG. **5**;

FIG. **8** is a cross sectional view taken along the dotted line C-C as shown in exemplary FIG. **5**;

FIG. **9** is a perspective view showing a clamp movement unit shown in exemplary FIG. **4**; and

FIG. **10** is an exemplary operational view showing the operation of a common fender mounting jig apparatus for multifarious vehicles according to an exemplary embodiment of the present invention.

Reference numerals set forth in the Drawings includes reference to the following elements as further discussed below:

10: fender panel	11: fender mounting jig
12: common clamp unit	13: clamp lifting member
14: forward/backward clamp moving member	
15: clamping main body frame	16: first clamping block
17: second clamping block	19: housing
20: housing connection bracket	21: fixing bracket
22: rotational link	23: connection member
24: actuator	26: operational rod
27: fixing block	28: rotational axis
29: fixing groove	30: fixing pin
31: body-in-white	32: clamping cylinder
33: left/right movable jig unit	
34: forwardly/backwardly movable jig unit	
35: upwardly/downwardly movable jig unit	
36: jig rotating unit	

It should be understood that the appended drawings are not necessarily to scale, presenting a somewhat simplified representation of various preferred features illustrative of the basic principles of the invention. The specific design features of the present invention as disclosed herein, including, for example, specific dimensions, orientations, locations, and shapes will be determined in part by the particular intended application and use environment.

In the figures, reference numbers refer to the same or equivalent parts of the present invention throughout the several figures of the drawing.

DETAILED DESCRIPTION

Hereinafter reference will now be made in detail to various embodiments of the present invention, examples of which are illustrated in the accompanying drawings and described below. While the invention will be described in conjunction with exemplary embodiments, it will be understood that the present description is not intended to limit the invention to those exemplary embodiments. On the contrary, the invention is intended to cover not only the exemplary embodiments, but also various alternatives, modifications, equivalents and other embodiments, which may be included within the spirit and scope of the invention as defined by the appended claims.

FIG. **3** is a perspective view showing a fender panel mounted on a common fender mounting jig apparatus according to a preferred embodiment of the present invention, FIG. **4** is a perspective view showing the common fender mounting jig apparatus as shown in FIG. **3**, FIG. **5** is an enlarged view showing A portion shown in FIG. **4**.

In addition, FIG. **6** is a front view of FIG. **5** from viewing in an A direction indicated by arrow, FIG. **7** is a cross sectional view taken along the dotted line B-B as shown in FIG. **5**, FIG. **8** is a cross sectional view taken along the dotted line C-C as shown in FIG. **5**, and FIG. **9** is a perspective view showing a clamp movement unit shown in FIG. **4**.

The present invention relates to a common fender mounting jig apparatus to be used with multifarious vehicles that is capable of responding to multiple shapes of fender panels **10** of multifarious vehicles, e.g., 6 models of vehicles, by using the common clamp unit **12**.

The common fender mounting jig apparatus for multifarious vehicles may include a common clamping unit **12** for clamping fender panels **10** of multifarious vehicles, a clamp movement unit for moving the common clamping unit **12** upwardly and downwardly, forwardly and backwardly, a fender mounting jig **11** mounted on its upper face with the common clamping unit and the clamp movement unit, and a jig movement unit and a jig rotating unit for moving and rotating the fender mounting jig.

The common clamp unit **12** may also include a clamp main body frame **15** arrayed in a vertical direction on a base plate,

and a clamping block installed on an upper portion of the clamp main body frame **15** to clamp the fender panel **10**.

The clamping block is formed of a first clamping block **16** arrayed at an upper portion thereof and a second clamping block **17** arrayed at a lower portion of the first clamping block **16**.

The first clamping block **16** is rotatably supported by a rotation link **22**. The second clamping block **17** is installed in a horizontal direction on an upper portion of the clamp main body frame **15** by means of a fixing bracket **21**.

Structurally, a first end of the rotation link **22** is connected to the first clamping block **16**. A first or middle portion of the rotation link **22** is coupled to the connection member **23** by means of a hinge axis, and a second portion of the rotation link **22** at a second end is connected to a piston rod of a clamping cylinder.

For example, when the piston rod of the clamping cylinder is inserted into the cylinder main body of the clamping cylinder in a lower direction, the second end of the rotation link **22** is pulled toward the lower direction, and the first end of the rotation link **22** is turned on an axis of the hinge toward an upper portion thereof, thereby making the first clamping block **16** rotate in an upper direction and releasing the clamping state.

Inversely, when the piston rod of the clamping cylinder is withdrawn from the cylinder main body of the clamping cylinder in an upper direction, the second end of the rotation link **22** is pushed upward and the first end of the rotation link **22** turns on a middle axis of the hinge in a lower direction, thereby making the first clamping block **16** rotate in a lower direction and clamping the fender panel **10**.

In one embodiment of the present invention, the first and second clamping blocks **16** and **17** may have a polygonal shape, for instance, a hexagonal shape, wherein each face of the clamping blocks is flat-shaped and is mounted thereon with the fixing block **27** thereby allowing for a different fender shape for each of 6 models of vehicles. Accordingly, fixing block **27** may be interchanged by rotation according to the different shape of the fender panel **10** for each model of vehicles. Thus, there is no need to modify the existing clamping unit or additionally manufacture a new clamping unit to comply with a new fender shape when a new model of vehicle is applied.

The fixing block **27** may be made of a mono cast (MC) nylon, so that it does not scratch the fender panel **10** as would occur if other materials such as iron, etc. were used when clamping the fender panel. The MC nylon is an engineering plastic which is made by mixing nylon monomer with reactive catalysts and injecting the mixture into a mold. The mixture is then molded by a chemical change under atmospheric pressure. Accordingly, as will be understood by those skilled in the art, MC nylon has superior characteristic compared with a commonly extruded nylon product. Also, the fixing block **27** may be processed having a curved surface to meet the shape of the fender panel **10**.

Each of the six fixing blocks **27** may also be fixed to each face of the clamping block by means of the fixing pin **30**, and used selectively by rotating or fixing the clamping block, thereby coping with the different shapes of fenders even though a different fender panel of another model of vehicle is applied.

For example, the fixing block **27** may be formed of the first to sixth fixing blocks **27**. In this example, the first fixing block **27** clamps the fender panel **10** of vehicle model, A. The second fixing block **27** clamps the fender panel **10** of vehicle model, B. The third fixing block **27** clamps the fender panel **10** of vehicle model, C. The fourth fixing block **27** clamps the fender panel **10** of vehicle model, D. The fifth fixing block **27** clamps the fender panel **10** of vehicle model, E, and the sixth fixing block **27** clamps the fender panel **10** of vehicle model, F.

At this time, in order to clamp the fender panel **10** of vehicle model A, the first fixing block **27** of the first clamping block **16** is positioned in a direction of 6 o'clock and the second fixing block **27** of the second clamping block **17** is positioned in a direction of 12 o'clock, thereby rotating the first clamping block **16** to clamp the fender panel **10**.

To selectively replacing the fixing block **27**, the common clamp unit **12** includes an axis of rotation **28** that is inserted into the clamping block so that the axis may be rotated together with the clamping block. Additionally, a driving motor may be connected to the axis of rotation to rotate the axis of rotation **28**.

The driving motor may be selected among any small sized and accurately controllable motors, e.g., an ultrasonic motor, a Brushless Direct Current (BLDC) motor, etc., without any other restriction on its selection. When the driving motor is driven, the axis of rotation **28** rotates accordingly. Thus, the clamping block connected to the axis of rotation **28** also rotates by the same angle.

Also, the common clamp unit **12** may also include with a position stopper so that a plurality of fixing block **27** may selectively be used to conform to the shape of the fender panel **10** of each model of vehicle during the clamping the fender panel **10**.

The common clamp unit **12** may also have a housing **19** that is arrayed in a concentric circle shape along a circumference of the axis of rotation **28**. The driving motor is mounted in the interior of the housing **19**, and a bushing, e.g., an oil-less bushing, is mounted between the housing **19** and the axis of rotation **28** so that the axis of rotation **28** may be rotated smoothly.

The position stopper may also include an actuator **24** mounted at the outside of the housing **19** and an operation rod **26** mounted at the inner side of the actuator **24** movably in an upward direction and a downward direction.

In some embodiments of the present invention, the actuator **24** may make the operation rod **26** move upwardly and downwardly by means of solenoid, pneumatic tool, and ultrasonic waves.

Additionally, an end surface of the axis of rotation **28** may be formed thereon with fixing grooves **29** at a regular interval along its circumference. These fixing grooves serve to stop the rotation of the axis of rotation **28** when the operation rod **26** moves in an upward direction or downward direction to thereby be inserted into the fixing groove **29**.

The fixing grooves **29** may be formed of first to sixth fixing grooves **29** formed at positions corresponding to the fixing block **27**. For example, when the first fixing groove **29** is positioned and fixed in a direction of 12 o'clock on the axis of rotation **28** by means of the operation rod **26**, the first fixing block **27** is positioned in a direction of 6 o'clock on the is first clamping block **16** thereby clamping the fender panel **10** of vehicle model, A

Also, the second to sixth fixing grooves **29** may be positioned and fixed in a direction of 12 o'clock on the axis of rotation **28** by means of the operation rod **26**, thereby the second to sixth fixing block **27** may be positioned in a direction of 6 o'clock on the first clamping block **16** so as to clamp each of the fender panels **10** of vehicle models B to F.

The clamping cylinder **32** may be mounted on the clamping main body frame **15** by a cylinder fixing bracket that is protruded at a middle portion of the clamping main body frame **15**. Additionally, the cylinder main body of the clamping

cylinder **32** is mounted on the clamping main body frame **15** by means of the cylinder fixing bracket. The piston rod of the clamping cylinder **32** may be hinge-ably coupled to a rear end of the rotation link **22** connected to the first clamping block **16** and the clamping cylinder **32** allowing the first clamping block **16** rotate toward the second clamping block **17** thereby clamping the fender panel **10**.

The clamp movement unit may include a clamp lifting member **13** for moving the common clamp unit **12** upwardly and downwardly and a forward/backward clamp moving member **14** for moving the common clamp unit **12** forwardly and backwardly.

At this time, the clamp lifting member **13** may have a lifting frame and lifting guide, to guide and move the common clamp unit **12** upwardly and downwardly through the lifting guide. Here, an electric motor cylinder may also be used as a driving unit of the common clamp unit **12**.

The forward/backward clamp moving member **14** may have a forwardly and backwardly moving frame and a forwardly and backwardly moving guide that are mounted on the fender mounting jig **11**, to guide and move the common clamp unit **12** through the forwardly and backwardly moving guide.

Also, a jig rotating unit **36** may include a rotational shaft mounted at a lower portion of a jig, and a servo motor for rotating the rotational shaft. The jig rotating unit **36** may transfer a turning force to the rotational shaft through the servo motor to rotate the fender mounting jig **11** in a 90 degree arc.

In addition, the jig moving unit may move the fender mounting jig **11** along 3 axes, that is, the jig moving unit may include an upwardly/downwardly movable jig unit **35** for moving the fender mounting jig **11** upwardly and downwardly, a forwardly/backwardly movable jig unit **34** for moving the fender mounting jig **11** forwardly and backwardly, and a right and left jig moving unit **33** for moving the fender mounting jig **11** in a right direction and a left direction. Herein, the jig moving unit may be selected without any restrictions thereof unless it is configured to move the fender mounting jig **11** along three axes.

The operation of the common fender mounting jig apparatus for multifarious vehicles having the above-described configuration will be described as follows.

FIG. **10** is an operational view showing the operation of a common fender mounting jig apparatus for multifarious vehicles according to the preferred embodiment of the invention.

The common fender mounting jig apparatus for multifarious vehicles includes the common clamp unit **12** for mounting the fender panels **10** having different shapes and different sizes according to various models of vehicles on the body-in-white **31**, and the clamp lifting member **13** and the forward/backward clamp moving member **14** for moving the common clamp unit **12** from the fender mounting jig **11**.

By manipulating the clamp lifting member **13** and the forward/backward clamp moving member **14**, the position of the common clamp unit **12** may be controlled to meet the size of the fender panel **10** associated with each model of vehicle.

Next, by rotating the polygonal clamping block of the common clamp unit **12**, the fixing block **27** may be selected again at the current position thereof, or replaced with other fixing blocks having the shape corresponding to the fender panel **10** of the new model of vehicle being assembled. Thus, there is no need to modify the existing clamping unit, or manufacture a new clamping unit.

For example, when the fender panel **10** of vehicle model A is applied, the first fixing block **27**, having the shape corresponding to the fender panel **10** of vehicle model A, is selected.

At this time, as the driving motor is operated and the axis of rotation rotates accordingly, the first and second clamping blocks **16** and **17** connected to the axis of rotation **28** are rotated simultaneously. When the first fixing block **27** of the first clamping block **16** is positioned in the direction of 6 o'clock, the actuator **24** is operated and the operation rod **26** is thereby inserted into and engaged with the first fixing groove **29** of the axis of rotation **28**. When the first fixing block **27** of the second clamping block **17** is positioned in the direction of 12 o'clock, the actuator **24** is again operated and the operation rod **26** is thereby inserted into and engaged with the first fixing groove **29**, thereby selecting the first fixing block **27**.

Advantageously, when the fender panel **10** of vehicle model B is applied, the second fixing block **27** having a shape corresponding to the fender panel **10** of the vehicle model B may then be selected.

Accordingly, when other fender panels **10** of other vehicle models C, D, F and E are being applied, the third, fourth, fifth and sixth fixing blocks **27** may be selected according to the shape of the fender panels of the vehicle models C, D, E and F, respectively.

Next, if the first fixing block **27** is fixed by the operation rod **26**, after the fender panel **10** of vehicle model A is loaded on the second clamp block of the common clamp unit **12**, the first clamping block **16** is rotated toward the second clamping block **17** by means of the clamping cylinder **32** thereby clamping the fender panel **10** of vehicle model A.

At this time, the common clamp unit **12** may be arrayed at 2 points on an upper side of the fender panel **10**, at one point on one end of the fender panel **10** and at one point on a lower side of the fender panel **10**, respectively.

After an edge portion of the fender panel **10** is clamped by the common clamp unit **12**, the fender mounting jig **11** may be rotated 90 degrees by means of the jig rotating unit, the fender panel **10** may then be loaded onto the body-in-white **31**, and, then, the fender panel **10** may be assembled to the body-in-white **31** by means of a fastening means such as bolts, etc.

Next, the fender panel **10** is unclamped using the clamping cylinder **32**. The fender mounting jig **11** then returns to its original position.

As described in the foregoing, according to the present invention, the fixing block **27** having the same shape as the fender panel **10** of each model of vehicles is mounted on each face of the polygon (for instance, a hexagon) shaped clamping block, the clamping block is rotated thereby fixing the clamping block in its position by means of the position stopper, and the fixing block **27** attached to each face of the clamping block is used selectively, thereby making the one common clamp unit **12** possible to respond to various shapes of fender panels of multifarious vehicles. Thus, eliminating the need to modify the existing clamping unit or manufacture a new clamping unit to conform to a new fender panel of new vehicle model.

The invention has been described in detail with reference to preferred embodiments thereof. However, it will be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the appended claims and their equivalents.

What is claimed is:

1. A common fender mounting jig apparatus for multifarious vehicles, comprising:

a plurality of common clamping units for clamping fender panels of multifarious vehicles by using selectively a plurality of fixing blocks processed in compliance with a shape of a fender panel of each model of vehicle;

a clamp movement unit for moving each common clamping unit of the plurality of common clamping units upwardly/downwardly and forwardly/backwardly;

a fender mounting jig mounted on its upper face with the common clamping unit and loading the fender panel clamped by the common clamping unit on a body-in-white; and

a jig movement unit for moving and rotating the fender mounting jig,

wherein the common clamping unit comprises:

a first clamping block and a second clamping block each having a polygonal shape and mounted on each face of the polygonal shape with a fixing block according to each model of vehicle, thereby clamping the fender panels each having a different fender shape for each model of vehicle, the first clamping block and the second clamping block being arranged such that the fixing blocks are interchangeable by rotation according to the different fender shape for each model of vehicle.

2. The common fender mounting jig apparatus for multifarious vehicles according to claim **1**, wherein the common clamping unit further comprises:

a driving motor connected to the first and second clamping blocks through an axis of rotation to rotate the first and second clamping blocks.

3. The common fender mounting jig apparatus for multifarious vehicles according to claim **2**, wherein the axis of rotation is formed on its circumference with fixing grooves to use, selectively, the fixing blocks; and the fixing block fixed by an actuator for pushing an operation rod into the fixing groove.

4. The common fender mounting jig apparatus for multifarious vehicles according to claim **2**, wherein the first and second clamping blocks are formed in a hexagon shape.

5. A mounting jig apparatus for use in assemble multifarious vehicle models, comprising:

a plurality of common clamping units for clamping panels of multifarious vehicles by using, selectively, a plurality of fixing blocks processed in compliance with a shape of a panel associated with each model of vehicle;

a first movement unit configured to move each common clamping unit of the plurality of clamping units upwardly/downwardly and forwardly/backwardly;

a mounting jig mounted on its upper face with each common clamping unit of the plurality of common clamping units; and

a second movement unit for moving and rotating the mounting jig,

wherein each common clamping unit comprises:

a first clamping block and a second clamping block each having a polygonal shape and mounted on each face of the polygonal shape with a fixing block according to each model of vehicle, thereby clamping the fender panels each having a different fender shape for each model of vehicle, the first clamping block and the second clamping block being arranged such that the fixing blocks are interchangeable by rotation according to the different fender shape for each model of vehicle.

6. The common fender mounting jig according to claim **5**, wherein each common clamping unit further comprises:

a driving motor connected to the first clamping block and the second clamping block through an axis of rotation to rotate the first and second clamping blocks.

7. The common fender mounting jig apparatus according to claim **6**, wherein the axis of rotation is formed on its circumference with fixing grooves to use, selectively, the fixing blocks; and the fixing block fixed by an actuator for pushing an operation rod into the fixing groove.

8. The common fender mounting jig apparatus for multifarious vehicles according to claim **6**, wherein the first and second clamping blocks are formed in a hexagon shape.

9. The common fender mounting jig apparatus according to claim **5**, wherein mounting jig is a fender mounting jig that is configured to load the fender panel clamped by the common clamping unit onto a body-in-white.

10. The common fender mounting jig apparatus according to claim **5**, wherein the first movement unit is a clamping movement unit and the second movement unit is a jig movement unit and wherein the mounting jig is a fender mounting jig.

11. The common fender mounting jig apparatus according to claim **1**, wherein the common clamping unit further comprises a clamp main body frame arrayed in a vertical direction on a base plate, and a clamping block installed on an upper portion of the clamp main body frame to clamp the fender panel.

12. The common fender mounting jig apparatus according to claim **11**, wherein the clamping block is formed of the first clamping block arrayed at an upper portion thereof and the second clamping block arrayed at a lower portion of the first clamping block.

13. The common fender mounting jig apparatus according to claim **1**, wherein the first clamping block is rotatably supported by a rotation link, and the second clamping block is installed in a horizontal direction on an upper portion of a clamp main body frame by a fixing bracket.

14. The common fender mounting jig apparatus according to claim **13**, wherein a first end of the rotation link is connected to the first clamping block, a first or middle portion of the rotation link is coupled to a connection member by a hinge axis, and a second portion of the rotation link at a second end thereof is connected to a piston rod of a clamping cylinder.

15. The mounting jig apparatus according to claim **5**, wherein each common clamping unit further comprises a clamp main body frame arrayed in a vertical direction on a base plate, and a clamping block installed on an upper portion of the clamp main body frame to clamp the fender panel.

16. The mounting jig apparatus according to claim **5**, wherein the clamping block is formed of the first clamping block arrayed at an upper portion thereof and the second clamping block arrayed at a lower portion of the first clamping block.

17. The mounting jig apparatus according to claim **5**, wherein the first clamping block is rotatably supported by a rotation link, and the second clamping block is installed in a horizontal direction on an upper portion of a clamp main body frame by a fixing bracket.

18. The mounting jig apparatus according to claim **17**, wherein a first end of the rotation link is connected to the first clamping block, a first or middle portion of the rotation link is coupled to a connection member by a hinge axis, and a second portion of the rotation link at a second end thereof is connected to a piston rod of a clamping cylinder.

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